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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,733	09/30/2003	Ramesh Varadaraj	RDH-0314	6371

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EXAMINER	
HYUN, PAUL SANG HWA	
ART UNIT	**PAPER NUMBER**
1743	

DATE MAILED: 06/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/675,733	VARADARAJ ET AL.	
	Examiner	Art Unit	
	Paul S. Hyun	1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 April 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,4 and 6-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,4 and 6-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

REMARKS

The amended claims submitted by Applicants have been acknowledged. Applicants cancelled claims 2, 5, 13 and 14 and consequently, claims 1, 3, 4 and 6-12 are now pending. It should be noted that amendments made to claim 1 has changed the scope of all pending claims.

With respect to the warning imposed on claim 14 for being a duplicate of claim 10 in the first Office Action, the warning has been withdrawn in light of the cancellation of claim 14.

With respect to the objection to claim 7 cited in the first Office Action, the objection has been withdrawn in light of the amendment.

With respect to the rejections of the pending claims under 35 U.S.C. 112 1st and 2nd paragraphs cited in the first Office Action, the rejections have been withdrawn in light of the amendments.

Claim Objections

Claim 1 is objected to because of the following informalities:

The limitations "asphaltenes" recited in steps (b), (c) and (e) should be changed to "asphaltene".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3, 4, 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stephenson et al. (US 5,021,498) in view of Miller et al. (US 5,925,233).

Stephenson et al. disclose a method of determining the effectiveness of an asphaltene dispersant, the method comprising the steps of:

extracting asphaltene from crude oil (see lines 25-30, col. 6);

dissolving the extracted asphaltene in a heavy aromatic naphtha solvent having a boiling point above 200 degrees Celsius (see lines 29-30, col. 6);

mixing the asphaltene/aromatic naphtha solution with a hexane solution containing an asphaltene dispersant in a centrifuge tube (see lines 17-23, col. 6);

measuring the rate of precipitation of the asphaltene (see lines 31-43, col. 6); and

comparing the difference between said rate of precipitation with the rate of precipitation of a blank, the blank comprising all the components of the centrifuge tube except for the dispersant (see lines 51-69, col. 6 and Tables I-VI on col. 7-12).

The reference also discloses that the initial ratio of hexane:heavy aromatic naphtha solvent is 10ml:100uL, or 100:1 (see lines 17-25, col. 6). 1 ml of the mixed solution, which contains ~0.99ml of hexane and ~0.01ml of the aromatic solvent, is then

further diluted by 3ml of pure aromatic solvent before conducting a colorimetric analysis of the precipitation (see lines 38-41, col. 6), which produces a final ratio of hexane:heavy aromatic naphtha solvent to 1:3 if the ratio is calculated using significant figures.

The method disclosed by Stephenson et al. differs from the claimed invention in that the aromatic solvent used in the method disclosed by the reference has a boiling point above 200 degrees Celsius. The solvents of the claimed invention all have boiling points below 200 degrees Celsius. However, it does not appear that the boiling point of the aromatic solvent is a significant parameter of the experiment. It appears that any aromatic solvent capable of dissolving the asphaltene can be used. The reference even discloses that an aromatic solvent having a boiling point below 200 degrees Celsius can be used to dissolve the asphaltene (see claim 5).

Miller et al. disclose a method for determining the effectiveness of an asphaltene dispersant, the method comprising the steps of:

dissolving asphaltene and asphaltene dispersant in a solution mixture comprising heptane and toluene (a.k.a. methyl benzene);

measuring the amount of precipitation; and

comparing said amount of precipitation with the amount of precipitation of a blank.

The reference discloses that an aromatic hydrocarbon (i.e. toluene) is used to solvate the asphaltene and an aliphatic hydrocarbon (i.e. heptane) is used to precipitate

the asphaltene since asphaltene is soluble in aromatic hydrocarbons and insoluble in aliphatic hydrocarbons. (see line 40, col. 2 – line 30, col. 3).

In light of the disclosure of Miller et al., it appears that any aromatic hydrocarbon capable of solvating asphaltene and any aliphatic hydrocarbon capable of precipitating asphaltene can be used in the methods disclosed by Stephenson et al. or Miller et al. It would have been obvious to one of ordinary skill in the art to use toluene to dissolve the asphaltene in the method disclosed by Stephenson et al. when an aromatic solvent having a boiling point above 200 degrees Celsius is unavailable.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stephenson et al. in view of Miller et al. as applied to claim 1, and in view of Mitchell et al. (US 3,779,902).

Claim 1 is unpatentable over Stephenson et al. in view of Miller et al. as discussed above. However, the references do not disclose the use of cyclopentane as the alkane solvent.

Mitchell et al. disclose that asphaltene is insoluble and forms a precipitate in cyclopentane (see Table 1, col. 8). Given that the purpose of the alkane solution in the methods disclosed by Stephenson et al. and Miller et al. is to precipitate the asphaltene, it would have been obvious to one of ordinary skill in the art to use cyclopentane instead of hexane in situations where hexane is unavailable.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stephenson et al. in view of Miller et al. as applied to claim 1, and in view of Karr, Jr. (US 4,018,663).

Claim 1 is unpatentable over Stephenson et al. in view of Miller et al. as discussed above. However, the references do not disclose the use of cyclopentane as the alkane solvent or the use of benzene as the aromatic solvent.

Karr, Jr. discloses that asphaltene is soluble in benzene and insoluble in cyclohexane (see lines 19-20, col. 4). Given that the purpose of the aromatic solvent is to dissolve the asphaltene and the purpose of the alkane solution is to precipitate the asphaltene in the methods disclosed by Stephenson et al. and Miller et al., it would have been obvious to one of ordinary skill in the art to use cyclohexane instead of hexane and benzene instead of a heavy aromatic naphtha solvent in situations where hexane and a heavy aromatic naphtha solvent having a boiling point above 200 degrees Celsius are unavailable.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stephenson et al. in view of Miller et al. as applied to claim 1, and further in view of Thorssen et al. (US 5,207,953).

Claim 1 is unpatentable over Stephenson et al. in view of Miller et al. as discussed above. However, the references do not disclose the use of ethyl benzene as the aromatic solvent.

Thorssen et al. disclose that asphaltene is soluble in ethyl benzene (see lines 64-67, col. 2). Given that the purpose of the aromatic solvent is to dissolve the asphaltene in the methods disclosed by Stephenson et al. and Miller et al., it would have been obvious to one of ordinary skill in the art to use ethyl benzene instead of a heavy aromatic naphtha solvent in situations where a heavy aromatic naphtha solvent having a boiling point above 200 degrees Celsius is unavailable.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stephenson et al. in view of Miller et al. as applied to claim 1, and further in view of Haney (US 3,617,500).

Claim 1 is unpatentable over Stephenson et al. in view of Miller et al. as discussed above. However, the references do not disclose the use of isopropyl benzene as the aromatic solvent.

Haney discloses that asphaltene is soluble in cumene (a.k.a. isopropyl benzene) (see lines 49-66, col. 1). Given that the purpose of the aromatic solvent is to dissolve the asphaltene in the methods disclosed by Stephenson et al. and Miller et al., it would have been obvious to one of ordinary skill in the art to use cumene instead of a heavy aromatic naphtha solvent in situations where a heavy aromatic naphtha solvent having a boiling point above 200 degrees Celsius is unavailable.

Response to Arguments

Applicant's arguments with respect to claims 1, 3, 4 and 6-12 have been considered but are moot in view of the new ground(s) of rejection.

New grounds of rejection is necessary because Applicants amended the claims to include only aromatic solvents having a boiling point below 200 degrees Celsius. The Stephenson et al. reference discloses the use of solvents having boiling points above 200 degrees Celsius.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul S. Hyun whose telephone number is (571)-272-8559. The examiner can normally be reached on Monday-Friday 8AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

6/9/06

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Supervisory Patent Examiner
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